

CLAIMS

1. For an electric motor used in a vehicle, which motor reaches different free-running speeds in different operating environments, a method comprising:
 - a) after start-up of the motor, establishing a number S1 representing a normal speed;
 - b) measuring operating speed S2 of the motor; and
 - c) if (S1 minus S2) is a positive number exceeding a predetermined limit, then either shutting down or reversing the motor.
2. Method according to claim 1, and further comprising:
 - d) if (S1 minus S2) is a negative number, then continuing operation of the motor.
3. Method according to claim 1, and further comprising:
 - d) examining at least one predetermined environmental parameter; and
 - e) if said parameter reaches a specified limit, then changing the predetermined limit.
4. Method according to claim 3, wherein the parameter is ambient temperature.
5. Method according to claim 3, and further comprising:
 - f) if (S1 minus S2) is found to be a positive number exceeding a predetermined limit in paragraph (e), then repeatedly finding (S1 minus S2) at different times prior to shutting down or reversing the motor.
6. A method, comprising:
 - a) maintaining an electric motor in a vehicle, said motor having a steady-state operating speed which changes when temperature and/or system voltage change;
 - b) starting the motor;
 - c) ascertaining steady-state speed of the motor immediately after starting, and setting a baseline speed;
 - d) measuring speed of the motor while running; and
 - e) if the sum (baseline speed - measured speed) is a positive number exceeding a predetermined number N, then either shutting off or reversing the motor.

7. Method according to claim 6, and further comprising:
 - f) changing the number N when predetermined events occur.
8. Method according to claim 6, and further comprising:
 - f) continuing operation of the motor if measured speed exceeds baseline speed.
9. Method according to claim 6, wherein baseline speed equals steady-state speed of the motor, immediately after initial acceleration.
10. Method according to claim 6, wherein, in paragraph (e), if the sum (baseline speed - measured speed) is found to be a positive number exceeding a predetermined number N, then
 - f) refraining from shutting off and reversing the motor at that time;
 - g) repeatedly finding said sum for each of several baseline speeds measured at successive times thereafter, and
 - h) if a specified number of the sums are all positive and exceeding N, then either shutting off or reversing the motor.
11. A method, comprising:
 - a) maintaining an electric motor in a vehicle, said motor having a steady-state operating speed which changes when temperature and/or system voltage change;
 - b) starting the motor;
 - c) ascertaining steady-state speed of the motor immediately after starting, and setting a baseline speed;
 - d) measuring speed of the motor while running;
 - e) if the sum (baseline speed - measured speed) is a negative number, then continuing operation of the motor;
 - f) if the sum (baseline speed - measured speed) is a positive number exceeding a predetermined number N, thereby indicating that a deceleration of N below baseline has occurred, then either shutting off or reversing the motor;
 - g) ascertaining whether predetermined events have occurred, and if so, changing the predetermined number N; and
 - i) repeating processes of paragraphs (a) - (f) at least once.

12. A method of operating a control for an electric motor, which motor reaches different free-running speeds in different operating environments, a method comprising:

- a) after start-up of the motor, establishing a number S1 representing a normal speed;
- b) measuring operating speed S2 of the motor;
- c) computing (S1 minus S2); and
- d) if (S1 minus S2) is a positive number exceeding a predetermined limit, then either shutting down or reversing the motor.

13. Apparatus, comprising:

- a) an electric motor in a vehicle, said motor having a steady-state operating speed which changes when temperature and/or system voltage change;
- b) a control for
 - i) ascertaining steady-state speed of the motor immediately after starting, and setting a baseline speed;
 - ii) measuring speed of the motor while running; and
 - iii) if the sum (baseline speed - measured speed) is a positive number exceeding a predetermined number N, then either shutting off or reversing the motor.

14. Apparatus according to claim 13, and further comprising:

- c) means for changing the number N when predetermined events occur.

15. Apparatus according to claim 13, and further comprising:

- c) means for continuing operation of the motor if measured speed exceeds baseline speed.

16. Apparatus according to claim 13, wherein baseline speed equals steady-state speed of the motor, immediately after initial acceleration.

17. Apparatus, comprising:

- a) an electric motor in a vehicle, said motor having a steady-state operating speed which changes when temperature and/or system voltage change;
- b) means for
 - i) ascertaining steady-state speed of the motor immediately after starting, and setting a baseline speed;
 - ii) measuring speed of the motor while running;
 - iii) if the sum (baseline speed - measured speed) is a negative number, then continuing operation of the motor;
 - iv) if the sum (baseline speed - measured speed) is a positive number exceeding a predetermined number N, thereby indicating that a deceleration of N below baseline has occurred, then either shutting off or reversing the motor;
 - v) ascertaining whether predetermined events have occurred, and if so, changing the predetermined number N; and
 - vi) repeating processes of paragraphs (a) - (f) at least once.

18. For an electric motor used in a vehicle, which motor reaches different free-running speeds in different operating environments, apparatus comprising:

- a) means for establishing a number S1 representing a normal speed after start-up of the motor;
- b) means for measuring operating speed S2 of the motor; and
- c) means for either shutting down or reversing the motor, if (S1 minus S2) is a positive number exceeding a predetermined limit.

19. Apparatus according to claim 18, and further comprising:

- d) means for examining at least one predetermined environmental parameter, and if said parameter reaches a specified limit, then changing the predetermined limit.

20. Apparatus according to claim 19, wherein the parameter is ambient temperature.

21. Method according to claim 1, and further comprising:

- d) using the motor to operate a window.

22. Method according to claim 6, and further comprising:

- f) using the motor to operate a window.

23. Method according to claim 11, and further comprising:

- j) using the motor to operate a window.

24. Method according to claim 12, and further comprising:

- e) using the motor to operate a window.

25. Apparatus according to claim 13, and further comprising:

- c) a window which the motor operates.

26. Apparatus according to claim 17, and further comprising:

- c) a window which the motor operates.

27. Apparatus according to claim 17, and further comprising:

- c) a window which the motor operates.

28. Apparatus according to claim 18, and further comprising:

- d) a window which the motor operates.